

Endothelium

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The **endothelium** is the layer of thin specialized epithelium, comprised of a single layer of flat cells that line the interior surface of blood vessels, forming an interface between circulating blood in the lumen and the rest of the vessel wall. Endothelial cells line the entire circulatory system, from the heart to the smallest capillary.

Endothelium of the interior surfaces of the heart chambers are termed as endocardium. Both blood and lymphatic capillaries are composed of a single layer of endothelial cells.

Endothelial tissue is a specialized type of epithelium tissue (one of the four types of biological tissue in animals).

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Function

Endothelial cells are involved in many aspects of vascular biology, including:

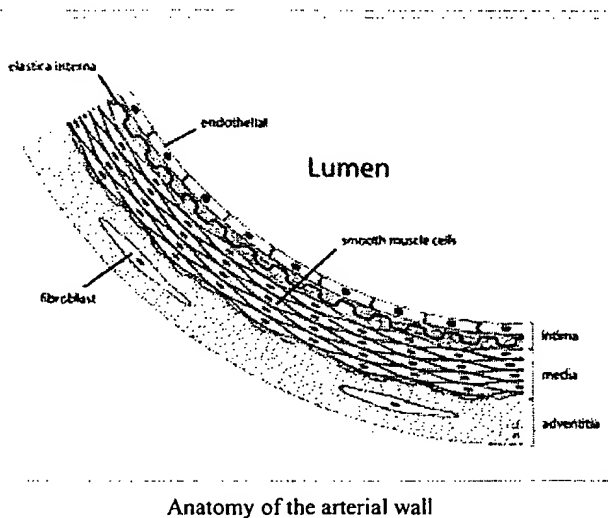
- vasoconstriction and vasodilation, and hence the control of blood pressure
- blood clotting (thrombosis & fibrinolysis)
- atherosclerosis
- formation of new blood vessels (angiogenesis)
- inflammation and swelling (oedema)

Endothelial cells also control the passage of materials — and the transit of white blood cells — into and out of the bloodstream.

In some organs, there are highly differentiated endothelial cells to perform specialized 'filtering' functions. Examples of such unique endothelial structures include the renal glomerulus and the blood-brain barrier.

Pathology

Endothelial dysfunction, or the loss of proper endothelial function, is a hallmark for vascular diseases, and often leads to atherosclerosis. This is very common in patients with diabetes mellitus, hypertension or other chronic pathophysiological conditions. One of the main mechanisms of endothelial dysfunction is the



Anatomy of the arterial wall

diminishing of nitric oxide, often due to high levels of asymmetric dimethylarginine, which interferes with the normal L-arginine-stimulated nitric oxide synthesis.

See also

- Endothelium-derived relaxing factor (EDRF)
- Robert F. Furchgott (1998 Nobel prize for discovery of EDRF)
- Caveolae
- Weibel-Palade bodies
- Endothelial microparticles
- Endocardium

External links

- Endothelial Cell Markers - Antibody Review (<http://antibodybeyond.com/reviews/ec-marker.htm>)
- Endothelium (<http://www.tandf.co.uk/journals/titles/10623329.asp>) -- Journal of Endothelial Cell Research
- synthetic matrix for endothelial cell culture (<http://www.puramatrix.com/>)
- Dictionary at eMedicine *endothelium* (<http://www.emedicine.com/asp/dictionary.asp?keyword=endothelium>)
- Organology at UC Davis *Circulatory/vessels/capillaries1/capillaries3* (<http://trc.ucdavis.edu/mjguinan/apc100/modules/Circulatory/vessels/capillaries1/capillaries3.html>) - "Capillaries, non-fenestrated (EM, Low)"

References

- Molecular Biology of the CELL, 4th edition, Alberts et al., 2002

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